(references will be found in Hann's "Lehrbuch der Meteorologie", 1st edition, pp. 113–115), students who do not read that language would do well to examine the "frequency" tables given in Doctor Abbe's memoir, pp. 177–188, and to read the explanatory text which accompanies them.

NEW METEOROLOGICAL STATIONS IN GUAM AND YAP.

The latest annual report of the Philippine Weather Bureau[2] contains interesting particulars regarding the stations recently opened by that Bureau in the islands of Guam and Yap. Both of these islands are now connected by cable with Manila; and the erection of the new stations greatly increases the efficiency of the Philippine Weather Bureau as an outpost to guard the whole of the Far East against surprises in the line of typhoons.

The meteorological station in Guam is located at the cable office on a cliff of Orote promontory, near the village of Sumay, and about seven and one-half miles from Agaña, the capital of the island. The observer in charge is the superintendent of the cable office. In Yap, which is the seat of German administration in the Western Carolines, the station is situated at the Capuchin Mission, and is operated by the missionaries. Both stations went into commission July 1, 1905.

A small amount of meteorological work had previously been done in both these islands. In Guam observations have been made by the United States naval authorities since November 1, 1901, the data for 1902 having been fully discussed by Dr. C. Abbe, jr.[3] The Germans have been making observations in Yap for the past seven years.

RAINFALL OF KUSAIE, CAROLINE ISLANDS.

The recently published results of five years' observations by an American missionary, Dr. C. F. Rife, on the island of Kusaie, Eastern Carolines,[4] give for this station the remarkable annual rainfall of 6472 mm. (254.8 inches, or over 21 feet). This record is exceeded at only some half-dozen stations on the globe (Cherra Punji, India, 11,628 mm.; Debundja, Kamerun, 10,454 mm.; Málcolmpeth, India, 6795 mm.; Lalakhal, India, 6727 mm.; Greytown, Nicaragua, 6583 mm.; Tami, German New Guinea, 6550 mm.).

For the following interesting particulars regarding the location of this station,[5] I am indebted to Rev. Irving Channon, a former missionary in Kusaie, who writes from Oberlin, Ohio:

> The station is located on the lee side of the island, on the lower slope of a range of mountains running from north-northeast to south-southwest, so that our exposure is to the west by north or west-northwest. The range is 2000 feet high at the highest point, but just back of the mission is about 1500 feet. Doctor Rife's house, where the measurements of rainfall have been taken, is about sixty-five feet above the sea. The northeast trade winds blow from December to April 1, but are not so strong, of course, in our latitude as farther north. Southeast trades are slight, and westerly winds are also slight and uncertain, as we are just at the eastern limit of the westerly monsoons. Some years we have several weeks of light westerly winds, but often scarcely any.

At Lelahafen, on the same island, observations taken by the German officials indicate a considerably smaller rainfall—probably because of some difference in the exposure. The records of both stations, however, show that this is one of the rainiest regions of the world. The number of rainy days at the American mission is 280. In other words, it rains five days in the week, on an average; and this average holds good, approximately, throughout the year, all the months being exceedingly rainy.

[2] Sixth annual report of the Philippine Commission, 1905. Washington, 1906. Part 2. Appendix L. Pp. 391–416.

[3] Report of the Eighth International Geographic Congress, 1904. Washington, 1905. Pp. 246–265. Abstract in Meteorologische Zeitschrift, March, 1906. P. 141.

[4] Mitteilungen von Forschungsreisenden und Gelehrten aus den Deutschen Schutzgebieten, 1905. 18 Bd. 4 Hft. P. 375. Also Meteorologische Zeitschrift, June, 1906. P. 268.

[5] Approximate latitude 5° 20′ N., longitude 163° 5′ E. of Greenwich.

NEW STATIONS IN THE CANAL ZONE.

The newly organized Division of Meteorology and River Hydraulics under the Isthmian Canal Commission has put into operation fully equipped meteorological stations at Naos (an island in the Bay of Panama) and Ancon, at which observations of all the elements are made twice daily, at 8 a. m. and 8 p. m., seventy-fifth meridian time. These stations are supplied with thermograph, barograph, sunshine recorder, and self-recording rain gage, and are manned by former observers of the United States Weather Bureau. Rainfall stations are in operation at Cristobal (a suburb of Colon), Gatun, Bohio, Empire, Culebra, Rio Grande, La Boca, Alhajuela, and Gamboa.

THE TORNADO OF APRIL 12, 1906, AT STAFFORD, KANS.[1]

By W. E. SERIGHT, Stafford, Kans. Dated May 21, 1906.

This particular [tornado?] cloud, of which a photograph is sent, was the last of about six or seven that appeared in and around Stafford on the afternoon of April 12, 1906. It formed about 5:30 p. m., and was probably five or six minutes in passing. Its path was very narrow, not over 100 or 150 feet in width, but it seemed to be of terrific force wherever it struck.

FIG. 1.—Showing funnel-shaped cloud at Stafford, Kans.

In securing this negative the camera was pointing east of northeast; the large building facing the camera is about 100 feet wide, and about 300 feet from where the camera was; the small frame building is about 15 feet wide and about 200 feet from the site of the camera; the distance between the two buildings is about 100 feet; the small house at the left of the center of the picture is about 100 feet from the camera, while the tornado itself was about three-fourths of a mile distant.

[1] Through the kindness of Mr. W. E. Seright, photographer, Stafford, Kans., Mr. Richard H. Sullivan, Observer, Weather Bureau, Wichita, Kans., was able to secure for the Bureau the print from which the accompanying half tone has been prepared.—ED.